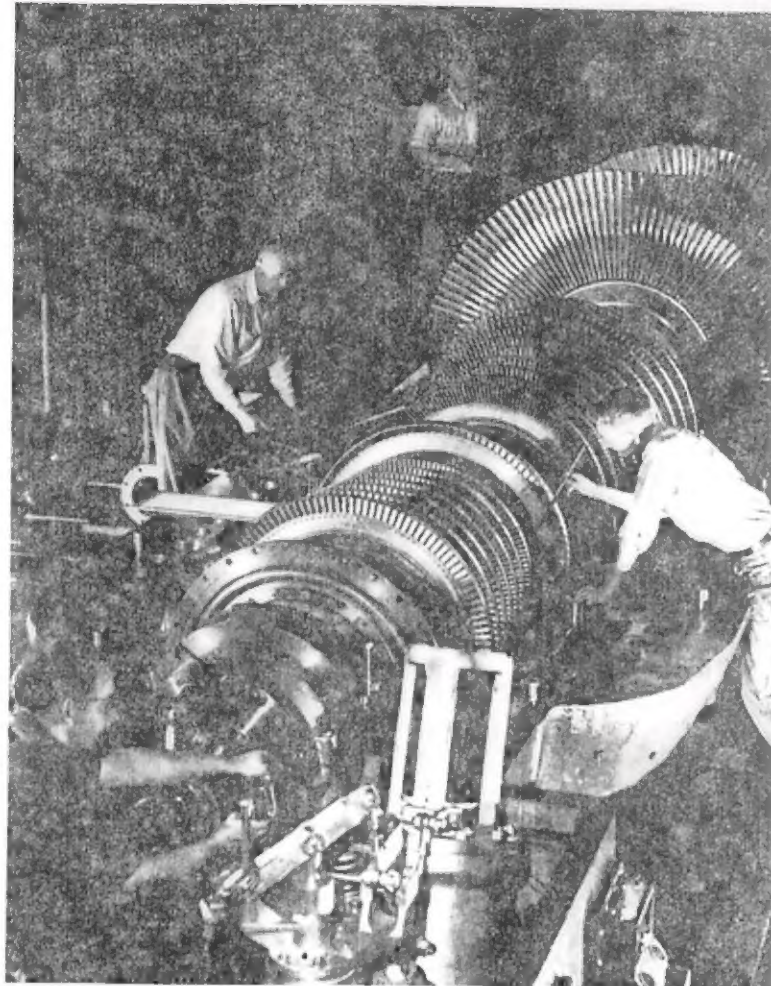
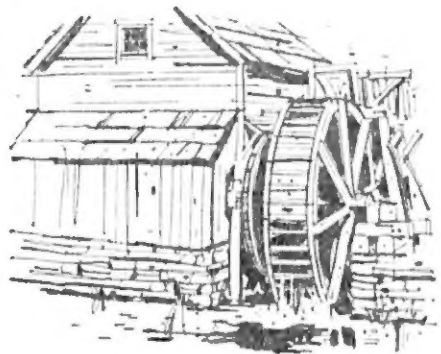
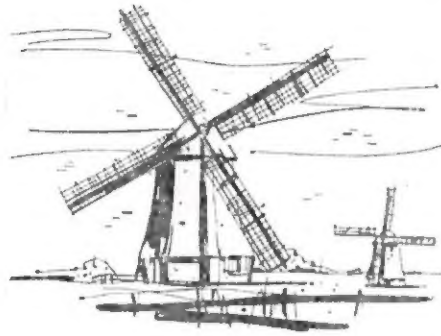


TURBINE



General Electric Co.

A Powerful Steam Turbine can generate all the electricity needed by about 1,000,000 people. Rushing steam spins bladed wheels, such as those in this partly-assembled turbine. Turbines were developed from the simple windmill, upper left, and water wheel, lower left.

TURBINE, *TUR* bihn or *TUR* byn, is a wheel turned by the force of a moving fluid, such as water, steam, or gas. It changes the force of the fluid into energy that can be used for work. Turbines rank among the simplest and most powerful machines. Generators driven by turbines produce electricity to light homes and to run factories. Turbines also drive ocean liners and some airplanes. A water wheel and a windmill are both turbines. So is a pinwheel that spins when you blow on it. The word *turbine* comes from the Latin word *turbo*, meaning that which *spins* or *whirls around*.

A turbine does not create power. It changes the force of moving fluids into *rotary*, or circular, motion. This motion can do useful work. For example, flowing water

spins a water wheel below a dam. The water wheel turns a generator that produces electricity, which lights homes and drives machinery. In this way, the energy of the flowing water is put to work. Nuclear power plants also use turbines to produce electricity.

There are three main kinds of turbines: (1) water, (2) steam, and (3) gas. Wind turbines are a fourth kind. But they can be used only in a few regions that have fairly steady winds. Water, steam, and gas turbines generate most of the electric power used today.

How Turbines Work

A paper pinwheel, the simplest kind of turbine, turns when you blow on it. But it does not produce much

Buckets are the parts of the turbine wheel that the moving fluids push against. They may be shaped like *scoops*, or like *blades* or *vanes* similar to the slats of a Venetian blind or the blades of a propeller.

Casing is the outside shell of a turbine. It holds the flowing fluids against the turbine wheel.

Condenser is a cooling device that changes the exhaust steam from a steam turbine into water.

Exhaust is the part of a turbine where the used fluids come out. The channel for the exhaust water from water turbines is called a *tailrace*.

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TURBINE TERMS

Nozzles are the parts of the casing that aim moving fluids against rows of buckets. They may look like curved blades or like nozzles of garden hoses.

Rotor is the rotating part of a turbine. It includes the buckets and the shaft on which they are mounted.

Stage is a single wheel of rotor buckets and its fixed ring of nozzles. Most steam and gas turbines have many stages, or sets of bucket wheels and nozzles. A water turbine usually has only one stage.

Throttle is a valve or faucet that controls the flow of fluids into a turbine.